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ABSTRACT

In response to the extraordinarily diverse adult population in college today, a new structural equation model adapted from Cabrera et al. (1993) integrated model of student retention was identified with the addition of two variables: career decision-making self-efficacy (CDMSE) and financial difficulty. The study examined the persistence/attrition decisions and behavior of 937 nontraditional students 24 years of age or older studying in two-year and four-year degree programs at an urban private research doctoral institution. Twenty-two variables were included (11 endogenous variables and 11 exogeneous) within a nonrecursive structural equation model. The 11 exogenous variables controlled for the background characteristics of the population of adult students. Of the eleven endogenous variables in the model, six of these--academic integration, cumulative GPA, goal commitment, institutional commitment, intent to persist, and persistence on the career self-efficacy expectations of adult students--were reported as significant. Implications that arise in explaining the decisions and behavior of adult students are explored to tap a less indeterminate future and seamless learning environments for higher education and its stakeholders alike. Contains approximately 75 references. (MKA)

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Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence

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Abstract

In response to the extraordinarily diverse adult student population present in college today, a new structural equation model adapted from Cabrera et al. (1993) integrated model of student retention was identified with the addition of two variables: career decision-making self-efficacy (CDMSE) and financial difficulty. The study examined the persistence/attrition decisions and behavior of nontraditional students (N = 937) 24 years of age or older studying in two-year and four-year degree programs of an urban private research doctoral institution by combining data from a survey questionnaire and institutional records. Twenty-two variables were included, eleven endogenous variables and eleven exogenous variables within a nonrecursive structural equation model. The exogenous variables controlled for the background characteristics of the population of adult students examined. By employing reciprocal causation (Bandura, 1997; 1989) within a conceptual framework, LISREL parameter estimates were obtained to establish the causal links among variables of a hypothesized path model. Of the eleven endogenous variables of a new integrated model of student persistence, CDMSE, a career development construct related to the perceived vocational futures and career related tasks of adult students has the widest range of influence among the endogenous variables. The total effects of six of eleven endogenous variables including academic integration, cumulative GPA, goal commitment, institutional commitment, intent to persist and persistence on the career self-efficacy expectations (CDMSE) of adult students were reported significant above an effect size criterion of .12 employed in a final trimmed model. By including all the effects that were obtained for the structural equation, a moderate percentage of the variance in persistence was explained (34%) that included effects on CDMSE. Implications that arise in explaining the decisions and behavior of adult students are explored to tap a less "indeterminate future" (Kerr, 1997) and "seamless learning environments" (Kuh, 1996) for higher education and its stakeholders alike.

As a response to the changing demographics of the American work force, the extraordinarily diverse adult student population present in college today and the problem of nontraditional student attrition at two-year and four-year urban colleges, the construct of career decision-making self-efficacy (CDMSE) is introduced into a new structural model that builds upon the integration of the models of Tinto (1975; 1987; 1993) and Bean and Metzner (1985) as synthesized by Cabrera et al. (1992a; 1992b; 1993). Although there has been an awareness of the problem of attrition within undergraduate degree programs, research efforts at examining this trend affecting adult students have been only moderately successful.

The cross-sectional survey research reported in this paper introduces a new and heretofore neglected dimension that proved to be critical to the understanding of the complexities of adult persistence. It identified a variable, CDMSE, a career planning and development construct, that previous models of the persistence phenomenon did not include, thus permitting a richer explanation of the process of student persistence (attrition's antonym). CDMSE identifies the degree of confidence students express about their competency or ability (self-efficacy) to embark upon informational, educational and occupational goal planning activities (Taylor & Betz, 1983; Betz, Klein & Taylor, 1996; Peterson, 1993a). With its inclusion in a new structural model of student persistence, the cognitive-initiated career expectations and agentive behavior of adult students can be more closely examined within the environmental, academic, social and institutional systems of undergraduate student life (see Figure 1). An attempt is made to examine the perceived vocational futures and career development of adult students (CDMSE) and, most importantly, to explain the relationships engendered within a new path model that ultimately lead to the central variable of this inquiry, persistence.

"Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence" adds another construct, financial difficulty, the attitudes that adult students express about financial difficulty while attending college and conceptually explores critical

ground beyond the social and intellectual development needs of students as conceptualized in the structural synthesis of Cabrera et al. (1992b;1993). As this new integrated model of student persistence verifies, career decision-making self-efficacy (CDMSE) is empirically shown to play an important role in the lives of nontraditional students with respect to their academic integration, institutional commitment, goal commitment, intent to persist, academic performance and persistence in college.

Insert Figure 1 about here

CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

An extensive literature on student persistence and attrition exists prior to the 1970's. However, few systematic investigations were performed that utilized conceptual models. Attempts to describe and explain the phenomenon of the dropout process from higher education were simply descriptive (Pantages & Creedon, 1978, Feldman & Newcomb 1969). Spady (1970) and Tinto (1975; 1987) introduced theoretical formulations from the disciplines of sociology and anthropology that incorporated the related notions of the rites of passage to adulthood and suicide as described and investigated by the researchers of Van Gennep (1960) and Durkheim (1951), respectively. These analogous notions were theoretically related to the concepts of interaction, socialization, and integration of individuals to institutions and to the concept of departure from higher education (Tinto, 1987). Besides exposing the atheoretical quality of attrition and persistence literature, Spady and Tinto independently recognized that writers in the existing literature provided descriptive explorations of the attrition process but failed to satisfactorily explore the interrelationships of factors, the longitudinal process of attrition, and its empirical implications (Spady, 1971; Tinto, 1987).

Based on the theory of suicide of Durkheim (1951), Spady, by analogy, introduced a sociological model of the undergraduate dropout process, perhaps "the first theoretical model of student persistence" (Mc Caffrey, 1991) in a postsecondary institution. In his analogy, Durkheim proposed that the more individuals are socially and intellectually integrated into society, the less likely they would commit suicide (Durkheim, 1951). By drawing a sociological parallel to the notion of suicide by Durkhiem, Spady suggested that the more students "are socially and intellectually integrated into the life of the institution" (Spady, 1971), the less likely they will depart from or withdraw from it. Although Spady was a forerunner among the early conceptual models employed, two theorists emerged to provide comprehensive frameworks in which they better explained college departure and withdrawal behavior. Cabrera et al. (1993) have aptly referred to these two models as the "student integration model" of Tinto (1975; 1987) and the "student attrition model" of Bean and Metzner (1985). Both models have been validated across various settings and populations (Cabrera et al., 1992a). Although the student attrition model has been validated empirically for traditional populations, its designers focus has been nontraditional student populations (Cabrera et al., 1993).

Each variable construct defined in variables in the study section below has either originated in the student integration model of Tinto (1975; 1987; 1993), or the student attrition model of Bean and Metzner (1985), the synthesis of Cabrera et al. (1992a; 1993), or in the new integrated model of student persistence by this author. These constructs are conceptually related, in Figure 1 above. Through the synthesis of Cabrera et al. (1993), variable constructs are interrelated with antecedent reference made to each respective investigator and their proposed system of relationships. Within Figure 1, Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence: A Hypothetical Model unfolds as a system of eleven variable constructs and their purported relationships while controlling for the background variables.

The Tinto Model--Student Integration Model

By employing a person-environment model (Lewin, 1935; Pervin, 1968), Tinto elaborates upon the work of Spady (Pascarella & Chapman, 1983), anecdotally incorporating the theory of suicide of Durkheim. Tinto (1975; 1987) provides an explanatory model or predictive model of student integration in which he explains the process by which individuals leave colleges and universities before graduating. Tinto emphasizes the constructs of goal and institutional commitment that students acquire or develop because of their interaction with individuals and subsequent integration into the institution (Tinto, 1975). Integration refers to the "extent of shared normative attitudes and values of peers and faculty in the institution and abides by the formal and informal structural requirements for membership in the community" (Pascarella & Terenzini, 1991). Students enter college with varying backgrounds, dispositions, intentions, and goals which in turn are "modified and reformulated on a continuing basis through a longitudinal series of interactions between the individual and institutional structures and members of the academic and social systems of the institution" (Pascarella & Terenzini, 1991). Satisfaction derived from these structures and academic and social systems by students are theoretically presumed to lead to integration and subsequently to retention (Pascarella & Terenzini, 1991; Pascarella, Duby & Iverson, 1983).

By employing the notion of person-environment in the student integration model, Tinto (1975; 1987; 1993) identifies attrition as the lack of congruency between students and institutions. The designers of the student integration theory match the motivation and academic ability of the student with the academic and social characteristics of the institution to establish two essential commitments: commitment to the educational goal and commitment to remain at the institution (Cabrera et al., 1993). Although the social and intellectual development of students may be the principal goal of institutions of higher education (Tinto, 1975, 1987), retention remains an important related outcome. As an

outcome, retention reflects upon the genuine concern of the institution for the social and intellectual development of students (Tinto, 1975; 1987). The student integration model of Tinto (1975; 1987; 1995) has been extensively researched in various settings and many institutions. Some reformulations of the "student integration model" of Tinto (Cabrera et al., 1993) have arisen, providing a wealth of empirical data and conceptual clarification (Fox, 1986; Pascarella et al., 1983; Pascarella & Terenzini, 1991). As it has been clearly stated,

> . . . other things being equal, the greater the individual's level of social and academic integration, the greater his or her subsequent commitment to the institution and commitment to the goal of graduation, respectively. These subsequent commitments, in turn, are seen, along with levels of integration as having a positive influence on persistence. (Pascarella et al., 1983)

The Bean Model--Student Attrition Model

As a model for nontraditional student socialization, the integration concept of Tinto remains a difficult task to achieve based on the social factors assumed. The social experiences of nontraditional students include important external factors, such as the influence of family, friends and employers. According to Bean and Metzner (1985), Tinto does not address these external factors in his theory of departure (Bean & Metzner, 1985). Bean explores an alternative model to explain persistence or attrition using an organizational process model of turnover (Bean, 1980; Cabrera et al. 1993) and a model of attitude-behavior relations interactions (Bentler & Speckart, 1979) often called the theory of reasoned action (Fishbein & Ajzen, 1975).

> Fishbein and Ajzen (1975) have argued that attitudes and past experiences act through intentions to influence future behavior. Consistent with this assumption, Bean found not only that intention had important direct effects on persistence, but also that the influence of several other important determinants, such as measures of institutional commitment, were transmitted through intention. (Pascarella et al., 1983)

Bean draws the conceptual analogy that student attrition is a similar process to organizational turnover in work organizations. By employing the theory of reasoned action

of Fishbein and Ajzen (1975), it is postulated that attitudes lead to intentions, which in turn lead to behavior. Behavioral intentions are formed by attitudes based upon beliefs. With respect to attrition from an academic institution, the attitudes toward the academic experience at the institution are presumed to affect the intent to continue in school, which in turn results in persistence or attrition, the actual staying in or leaving school by students. This theoretical overlay of reasoned action links the sets of variables in the model (Bean & Metzner, 1985). Behavioral intentions associated with persistence or attrition, act as predictors of persistence behavior or outcomes (Cabrera et al, 1993). Through person-environment interaction, beliefs are presumably influenced by the experiences of students with different characteristics of the institution that include institutional quality, courses and friends (Cabrera et al., 1993). In addition, factors external to the institution affect both attitudes and decisions in the student attrition model and are active while the student is attending the college (Bean & Vesper, 1990; Bean & Metzner, 1985). Environmental factors, excluded in the more traditional student analysis of Tinto (1975; 1987; 1993), play a compensatory role in the Student Attrition Model of Bean (Cabrera et al., 1993).

> Two compensatory interaction effects are included in the in the model . . . The predicted interactions are similar to the compensatory effects between social and academic integration identified by Tinto (1975) and found by Pascarella and Chapman (1983). Environmental variables are presumed to be more important for nontraditional students than academic variables. . . Thus, for nontraditional students, environmental support compensates for weak academic support, but academic support will not compensate for weak environmental support. (Bean & Metzner, 1985)

With subsequent variations and reformulations of the student attrition model, Bean & Vesper (1990) acquired empirical support for the involvement of direct and indirect effects of non-intellective or external factors such as family approval in the student attrition model. These factors, were found among six environmental, personal and organizational variables that served to explain most of the variance in the student attrition process (Bean & Vesper,

1990).

The Cabrera Model--Integrated Model of Student Retention

By drawing a comparison between the Student Integration Model of Tinto and the Student Attrition Model of Bean, Cabrera et al. (1993) recognized that a high degree of overlap between the constructs employed by each theory exists. According to Cabrera et al. (1993), both models incorporate background variables and view persistence as a "complex set of interactions over time" in which the match between the student and the institution remains critical (Cabrera et al., 1993). There is empirical evidence that the effects of organizational and environmental variables like social support are directly funneled by both theories through the intent to persist of students in college (Cabrera et al., 1993). Both theories converge with respect to organizational constructs like academic integration (courses) and commitments to the institution (institutional fit and quality) (Cabrera et al., 1992a; 1993). The integrated model of student retention celebrates an amalgam of the constructs of Tinto and Bean where both models converge and include the divergent advantages of the discriminant emphases of each model. In turn, the emphasis of the student attrition model on the role of factors external to the institution is utilized in the integrated model of student retention as a critical construct important to the attitudes and decisions of students (Bean, 1982a; Bean, 1982b; Cabrera et al., 1993). Cabrera et al. (1992a) built upon previous research to incorporate both theoretical frameworks of Tinto and Bean. In turn, a synthesis or baseline model of structural relations was formulated which included all the structural paths substantiated from the student attrition model. Beyond the constructs of social and academic integration, a relationship between goal identification and persistence has been cited (Astin, 1975, Beal & Noel, 1980, Peterson, 1993a), and this line of investigation is preserved in the integrated model of student retention with respect to goal commitment.

Since grade point average (cumulative GPA) loaded poorly (as an indicator of

academic integration) in the student integration model, cumulative GPA and academic integration were incorporated as interdependent constructs each demarcating independent positions in the synthesis of Cabrera et al. (1993). According to propositions of the student attrition model (Bean, 1985; Bean, 1990), social support and financial attitudes can influence and channel their effects upon academic integration, commitments to the institution, and produce persistence solutions as outcomes (Cabrera et al., 1993). In the structural model employed in this research, the incorporation of cumulative GPA and external variables that include financial attitudes and outside encouragement is similar. Cabrera et al. (1993) state that the

> . . . student integration model appears to suggest that academic integration, social integration, institutional commitment and, to some extent, goal commitment, exert the highest effects on persistence, research on the student attrition model emphasizes the role of intent to persist, attitudes, institutional fit, and external factors in the form of family approval of institutional choice, friend's encouragement to continue enrollment, finance attitudes, and perceptions about opportunity to transfer to other institutions on withdrawal decisions.

Cabrera et al. (1993) also compare the student integration model and the student attrition model based on the number of hypotheses validated in the empirical literature and conclude that the student integration model remains stronger than the student attrition model ("70 percent versus 40 percent"). In the student attrition model, more of the observable variance was explained as far as the persistence criterion is concerned ("44 Percent versus 38 percent") (Cabrera et al., 1993).

Career Decision-Making Self-Efficacy

The CDMSE (Betz & Hackett, 1981; Taylor & Betz, 1983), Career Decision-Making Self-Efficacy identifies the degree of confidence students express about their competency or ability (self-efficacy) to embark upon educational and occupational information-gathering and goal-planning activities (Peterson, 1993a). The relationship of the concept of agency, self-directedness or self-efficacy by Bandura (1997; 1989; 1986; 1977) to educational

development, career development, the prediction of academic performance, and/or academic outcomes remains well documented in the literature (Taylor & Betz, 1983; Betz & Hackett, 1987; Lent, Brown & Larkin; 1984; Multon, Brown & Lent, 1991; Lent, Larkin & Brown, 1986; Lent & Hackett, 1987). Career Decision-Making Self-Efficacy employs social cognitive theory as a career development measure and explores the role of self-referent thinking in guiding human motivation and behavior. It encompasses the person-environment situation or "mutually, interacting influences between persons and their behavior and environments" (Lent, Brown & Hackett, 1994). As originally conceived,

> Bandura (1977) and others Bandura and Adams, 1977; Bandura, Adams and Beyer 1977) developed a theoretical explanation of therapeutic change in which the concept of perceived self-efficacy plays the central mediational role. The concept of perceived self-efficacy refers to beliefs concerning one's capability of successfully engaging in a target behavior; strong perceived efficacy is postulated to lead to behavioral approach, and weak efficacy to lead to avoidance. (Betz & Hackett, 1987)

Self-efficacy as defined must be related to specific target behavior whereby beliefs about the ability of one to perform certain tasks successfully remain characteristic of certain behaviors (Peterson, 1993a). By definition, self-efficacy represents a perception and judgment of an individual of his or her abilities and competencies to organize and execute causes of action required to fulfill specific types of behavior or performances (Bandura, 1986). Self-efficacy beliefs are central to personal agency operating as a pervasive mechanism for self-directed pursuit (Lent, Brown & Hackett, 1994) and interact with other motivational systems of human endeavor, including personal capabilities and performance accomplishments (Peterson, 1993a; Bandura & Cervone, 1983). Self-efficacy beliefs may also be employed as a conceptual analog for perceived behavioral control incorporated in the theory of planned behavior (Ajzen, 1988; 1991; Ajzen & Madden, 1986). Elements of the theory of planned behavior and self-efficacy beliefs are conceptually integrated into the integrated model of student persistence by this author where attitude-behavior interactions,

reasoned action, environmental resources (social support and financial attitudes) and volitional control are concerned (Fishbein & Ajzen, 1975; Bentler & Speckart, 1979; Ajzen, 1991, Eagly & Chaiken, 1993).

> . . . self-efficacy percepts are postulated as helping to determine one's choice of activities and environments, as well as one's efforts expenditure, persistence, thought patterns, and emotional reactions when confronted by obstacles. Introduced into the career literature by Hackett and Betz (1981), self-efficacy has been found to be predictive of academic and career related choice and performance indices (Lent & Hackett, 1987; Multon, Brown, & Lent, 1991; Sadri & Robertson, 1993). (Lent, Brown, & Hackett, 1994)

CDMSE comprises a measure of behavioral competence and perceived self-efficacy in relation to a complex domain of behavior that can be summarized "as agency in educational and career pursuits" (Betz & Hackett, 1987).

As Braxton et al. (1997) and Lent et al. (1994) have clearly stated, career decision-making self-efficacy (CDMSE) has shown strong promise for persistence/attrition research as this investigation has empirically substantiated for the first time within a higher education research model involving nontraditional students. The relationship of the concept of agency, self-directedness or the concept of "self-efficacy" (Bandura, 1977; 1989) to educational development, career development and the prediction of academic performance and/or academic outcomes remains well documented in the literature (Luzzo, 1995; Taylor & Betz, 1983; Betz & Hackett, 1987; Lent, Brown & Larkin, 1984; Multon, Brown & Lent, 1991; Lent, Larkin & Brown, 1986; Lent & Hackett, 1987). The inclusion of CDMSE in the integrated model of student persistence accounts for the percepts of self-efficacy of nontraditional students in exploring or acquiring skills that make them desirable for the work place.

Although Peterson (1993a) incorporated CDMSE with elements of the student integration model of Tinto (1975; 1987; 1993) related to the constructs of integration and institutional commitment, empirical evidence was not explored with respect to adult student

persistence (Peterson, 1993a; 1993b). Peterson and delMas (1996) subsequently attempted to structurally evaluate CDMSE in a persistence model. Their path model fell short of the scope explored with the integrated model of student persistence that is adapted here with significant conceptual modifications to the integrated model of student retention of Cabrera et al. (1993). Through the dynamic interplay of CDMSE with other constructs therein, the new model explains persistence decisions or behavior that may be constrained by limited resources (financial difficulty and social support) or not wholly under the volitional control of adult students (Ajzen, 1991).

Financial Attitudes/Difficulty

Contrary to career decision-making self-efficacy, the environmental construct of financial attitudes/difficulty (Mallette & Cabrera, 1991) is also added by the researcher to explore a new integrated model of student persistence. Financial attitudes/difficulty examines the experiences of financial hardship or difficulty of adult students and reflects upon their experiences of available resources. Although the model of Cabrera et al. (1993) used financial attitudes/satisfaction as a single endogenous variable for finances in the integrated model of student retention, "Career Decision-Making and an Integrated-Model of Student Persistence" incorporates two financial attitudinal measures with regard to satisfaction and difficulty respectively. Career decision-making self-efficacy (Betz & Hackett, 1981; Taylor & Betz, 1983), financial attitudes/satisfaction (Cabrera et al., 1993) and financial attitudes/difficulty (Mallette & Cabrera, 1991) are amongst a total of eleven endogenous constructs explored in a new integrated model of student persistence.

Another model addition is employed and is better than the categorical variable specification for financial aid of Cabrera et al. (1992b). That is, this researcher used a continuos measure for financial aid, an actual disbursed monetary figure as an "objective component" (Cabrera et al., 1992) for student finances. As described, financial aid is explored as an enriched exogenous or background variable within a new integrated model

along with two orthogonal attitudinal components or constructs, financial attitudes/satisfaction (Cabrera et al., 1992b; Cabrera et al., 1993) and financial attitudes/difficulty (Mallette & Cabrera, 1991).

Conceptual Summary

As a summary, Figure 1 suggests a path of longitudinal interactions that hypothetically occur between students and an institution in a given term of study. With a conceptual overlay of the theory of planned behavior (Ajzen, 1991) and input from environmental variables (social support, financial attitudes/difficulty) and background characteristics, the career decision-making self-efficacy percepts, social integration and academic integration occurs within related subsystems of the college community to culminate in two fundamental commitments, a commitment to the institution and a commitment to the personal goals of students (Tinto, 1975; 1987; 1993). Through these commitments and performance outcomes measured by cumulative GPA, students either express an intent to persist or leave the institution, which results in a behavioral outcome of persistence or attrition, respectively (Cabrera, et al., 1993; Bean & Metzner, 1985).

RESEARCH DESIGN AND METHODS

Sample and Instrumentation

A survey questionnaire was distributed to a randomly selected sample of 937 adult students enrolled during the fall 1995 semester. After a 63 percent survey response and listwise deletion, the sample for data analysis comprised 455 adult students. The sample included students who were 24 years of age or older, whose cumulative credit hours were four or more credits and whose curriculum hours at the institution were two or more credits during the term of the investigation. Other background characteristics were obtained from university and school/divisional records. From these data sources, a total of 22 variables

was included in this research study in an effort to ascertain their relationship to persistence for the sample population.

Eleven endogenous variables are included in the integrated model of student persistence. In addition, eleven exogenous variables are introduced as controls and include in large part background or demographic variables. Degree program, one exogenous variable, differentiates between two-year and four-year degree programs and serves as a control. Two instruments were integrated and adapted for the sample being examined: the Career Decision-Making Self-Efficacy - Short Form (CDMSE-SF) scale (Betz, Klein & Taylor, 1996; Betz & Taylor, 1994; Taylor & Betz, 1983) and the "Student Experiences Survey" (Cabrera, 1988) employed in "integrated model of student retention" (Cabrera et al., 1993) (instruments used by permission). As an amalgam of these two instruments, a single survey questionnaire, the Adult Student Experiences Survey (ASES) was administered to collect attitudinal data and self-reported background characteristics. Other background characteristics were obtained from university and school/divisional records. As tested, the reliability of the scales employed in large part matched or surpassed the levels reported by their respective developers.

Variables in the Study

The predictor endogenous (independent) variables included: career decision-making self-efficacy (CDMSE), social support, financial attitudes/satisfaction, financial attitudes/difficulty, academic integration, social integration, cumulative GPA (Grade Point Average), institutional commitment, goal commitment and intent to persist. The exogenous variables of the model included eleven variables that pertained to student background: gender, race/ethnic affiliation, household income, financial aid, parents' educational level, academic degree aspirations, commuting time, student type, degree program, curriculum hours and hours employed. The criterion (a dependent endogenous variable) was persistence, a dichotomous outcome. The definitions of the variable constructs and variables are provided below:

Academic Integration was comprised of three survey items. The notions of the "anticipation of academic performance" and "satisfaction with course curriculum" by students was explored (Cabrera et al., 1993). Academic integration concerns the feelings students express about being a part of the academic life of the institution.

Background Variables are data or specific information collected about students prior to their enrollment at the institution (Bean & Metzner, 1985). Some background variables investigated are proximal to the term of inquiry reflecting data collected during a survey administration. The background variables investigated include: gender, race/ethnic affiliation, household income, financial aid, parents' educational level, academic degree aspirations, commuting time, student type, degree program, curriculum hours, and hours employed.

Career Decision-Making Self-Efficacy (CDMSE-SF), the CDMSE-SF (short form), is comprised of 25 items and identified the extent to which students are confident (have self-efficacy) about their ability to engage in educational and occupational information gathering and goal planning activities (Betz, Klein & Taylor, 1996; Hackett & Betz, 1981; Taylor & Betz, 1983, Peterson, 1993a).

Cumulative GPA (Grade Point Average) means academic performance as a continuous measure (0.000-4.000).

Financial Attitudes/Difficulty was comprised of three items and involved the "experience of financial difficulty" while at the institution (Cabrera, 1988; Mallette & Cabrera, 1991), the difficulty in financing a college education (Cabrera, 1988; Mallette & Cabrera, 1991), and the importance of financial aid has for continuing at the institution as expressed by students (Cabrera, 1988; Mallette & Cabrera, 1991).

Financial Attitudes/Satisfaction was comprised of two items and involved the satisfaction with the amount of financial support (grants, loans, family and jobs) received while attending the institution (Cabrera et al., 1992b, Cabrera et al., 1993) and the

satisfaction with financial aid programs at the institution (Mallette & Cabrera, 1991) expressed by students.

Goal Commitment was comprised of two items and involved the importance students ascribe to a college degree and the "importance of completing program of study" (Cabrera et al., 1993).

Institutional Commitment was comprised of four items and involved the confidence students have in their institutional choice, and their perceptions of "institutional fit and quality" (Cabrera et al., 1993). Institutional commitment concerned the feelings of attachment or belonging that students establish with the institution.

Intent to Persist was comprised of five items and involved the likelihood in re-enrolling at the institution as expressed by students.

Persistence is determined by the actual re-enrollment at the institution for the following term of study.

Social Integration was comprised of three items and involved the "close personal friendships" (Cabrera et al., 1993), the ease of meeting and making friends" (Cabrera et al., 1993), and the similarity of values and attitudes expressed by students (Cabrera, 1988; Pascarella & Terenzini, 1979, 1980). Social integration concerned the feelings of being a part of the social life of the institution as expressed by students

Social Support was comprised of four items and explores the construct of Cabrera et al. (1992b; 1993) "encouragement from friends and family."

Data Analysis Procedures

A two step data analysis was conducted that included measurement and structural stages. The measurement stage was performed separately with SPSS 6.13 (Norusis, 1994). A reliability analysis is presented in Table 1. After a reliability analysis was completed on the respective endogenous variable scales, data reduction was performed by means of a principal components procedure on the items of these same variable scales with SPSS 6.13

(Norusis, 1994). The principal components procedure incorporated a factor extraction with varimax rotation and computed factor scores (for each respondent), single numerical

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Insert Table 1 about here

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values that were equivalent to the respective endogenous variable scale data. The principal components procedure and computation of factor scores served as a measurement stage for the structural equation path model that followed.

Once reliable scale data for the endogenous variables were computed and subsequently reduced to single numerical values (factor scores) for each respondent by means of the data reduction procedure described above, PRELIS 2 was employed. PRELIS 2 produced data transformations among ordinal, categorical, and continuos variables and provided appropriate covariance matrices that included the asymptotic covariance matrix (Joreskog & Sorbom, 1993). The structural parameter estimation procedures and path analytic protocol of LISREL 8.14 followed using a weighted least squares (WLS) method that adjusted for non-normal conditions when one or more of the observed variables are ordinal (Joreskog & Sorbom, 1993). In short, LISREL 8.14 incorporated and processed the measurement stage data and simultaneously computed specified structural equations and a path model (Joreskog & Sorbom, 1993).

RESULTS

The total effects among the endogenous variables and on the exogenous variables of the integrated model of student persistence are summarily provided in Figures 2 and 3 below above an effect size criterion of .12. Standardized effects that are .12 or greater have a "meaningfulness" that can have an impact on policy analysis. This cutoff criterion approximates that commonly found in the literature (Pedhazur, 1997; Stevens, 1996; Hoyle,

1995; Loehlin, 1992; Cohen & Cohen, 1983). The standardized total effect size criterion of .12 suggests that a unit change in the total effect of a given endogenous or exogenous variable is associated with at least a twelve percent change (or more) on a given endogenous

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Table Figure 2 about here

Insert Figure 3 about here

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variable (or dependent outcome) examined. The trimmed model among the endogenous variables (see Figure 2 above) includes a total of 28 endogenous path relationships greater than the effect size criterion of .12. In addition, 26 exogenous variable path relationships of the endogenous variables were controlled and examined employing the same effect size criterion (see Figure 3 above).

The Squared Multiple Correlation (R^2) for Each Endogenous Variable

The explained variance determined by the Squared Multiple Correlation (R^2) for each endogenous variable is as follows: CDMSE **(16%)**, social support **(16%)**, financial attitudes/satisfaction **(11%)**, financial attitudes/difficulty **(4%)**, academic integration **(20%)**, social integration **(14%)**, institutional commitment **(30%)**, cumulative GPA **(12%)**, goal commitment **(24%)**, intent to persist **(28%)** and persistence **(34%)**.

The Total Effects of the Endogenous Variables on CDMSE

Most importantly, within a nonrecursive structural path model, CDMSE has significant total effects on all eleven endogenous variables within the model. Six of these

relationships are above .12 in magnitude within a trimmed model of structural effects and are listed in order of descending magnitude. The effects of CDMSE on the following endogenous variables are: academic integration (total effect = .305, $p < .001$), cumulative GPA (total effect = .263, $p < .001$), goal commitment (total effect = .189, $p < .001$), institutional commitment (total effect = .171, $p < .001$), intent to persist (total effect = . 129, $p < .001$) and persistence (total effect = .134, $p < .001$), the ultimate dependent variable within the integrated model (see Figure 2 above).

An examination of the total effects that CDMSE has on endogenous variables within the integrated model suggests that cognitive-initiated agentive behavior related to the career development of adult students moderately effects the feeling nontraditional learners express about being a part of the academic life of the institution (academic integration) and on their academic performance (cumulative GPA). In addition CDMSE, the decision-making competency about career tasks of adult students has a relatively small total effect on the level of importance that nontraditional learners experience about continuing their education for a college degree (goal commitment) and on the degree of affiliation or identification of adult students with the institution they are enrolled (institutional commitment). The remaining two total effects of intent to persist and persistence on career decision-making self-efficacy (CDMSE) are mentioned in the sections below.

<u>The Total Effects Explaining Intent to Persist</u>

The Squared Multiple Correlation (R^2) explaining the variance in intent to persist was 28 percent. The five highest ranked total effects of intent to persist on the endogenous variables within the trimmed integrated model of student persistence (effects > .12) are listed as follows in descending order of magnitude (see Table 2 below and Figure 2): 1) institutional commitment (total effect = .430 $p < .001$), 2) cumulative GPA (total effect = .212 $p < .001$), 3) academic integration (total effect = .211 $p < .001$), 4) social support (total effect = .173 $p < .001$) and 5) CDMSE (total effect = .129 $p < .001$). That is, the degree of affiliation or

identification that adult students experience for the institution in which they are enrolled (institutional commitment) has a moderate total effect on the intent to persist of nontraditional learners. In addition, the academic performance (cumulative GPA) and the degree of feeling of being a part of the academic life of the institution (academic integration) of adult students each has a relatively moderate total effect on the intent to persist of nontraditional learners. Also, encouragement from friends and family (social support) and their cognitive-initiated agentive behavior about career tasks (CDMSE) of nontraditional learners each has a small total effect on the intent to persist of adult students.

Insert Table 2 about here

In addition, the two highest ranked total effects of intent to persist on the exogenous variables within the trimmed integrated model of student persistence (effects > .12) are listed as follows in descending order of magnitude (see Table 3 and Figure 3): 1) household income (total effect = .295, $p < .001$) and 2) curriculum hours (total effect = .130, $p < .001$). Household income is a sociostructural determinant of the intent to persist of nontraditional students at a moderate level, as the standardized total effect suggests. Curriculum hours, an analog for student involvement, is a small total effect of the intent to persist of adult students.

Insert Table 3 about here

The Total Effects Explaining Persistence

The Squared Multiple Correlation (R^2) explaining the variance in persistence was 34 percent. The four highest ranked total effects of persistence on the endogenous variables

within the trimmed integrated model of student persistence (effects > .12) are listed as follows in descending order of magnitude (see Table 4 and Figure 2): 1) cumulative GPA (total effect = .347 $p < .01$), 2) intent to persist (total effect = .309, $p < .001$), 3) institutional commitment (total effect = .149 $p < .001$) and 4) CDMSE (total effect = .134, $p < .001$) (see Table 4 and Figure 2). That is, the academic performance (cumulative GPA) and intent to persist of nontraditional learners each has a moderate total effect level on the persistence or re-enrollment for a subsequent term of study by adult students. In addition, the degree of affiliation or identification with the institution and decision-making competency about career tasks (CDMSE) of adult students each has a small total effect on their re-enrollment at the institution or persistence in college.

Insert Table 4 about here

In addition, the two highest ranked total effects of persistence on the exogenous variables within the trimmed integrated model of student persistence (effects > .12) are listed as follows in descending order of magnitude (see Table 4 and Figure 3): 1) degree program (total effect = -.296, $p < .001$) and 2) curriculum hours (total effect = .172, $p < .001$). Regarding the exogenous variables, the persistence of adult students has a moderate total effect on the exogenous variable, degree program. Unlike associate degree program students, Bachelor of Science (BS) and Bachelor of Arts (BA) adult degree students have a moderate level of within-year persistence (from one semester to the next) at the institution. Finally, the persistence of adult students has a small total effect on the exogenous variable, curriculum hours. To some extent, curriculum hours provides a quantitative indication of the effects of the involvement of adult students, particularly the total effect of persistence on the number of enrolled course hours.

Insert Table 5 about here

Goodness of Fit Statistics

As a structural model, "Career Decision-Making Self-Efficacy and an Integrated Model of Persistence" has close to a "perfect fit," (Chi-square = 99.677 with 140 degrees of freedom; $p = .996$) (Joreskog & Sorbom, 1993). Although this Chi-Square statistic is an exceptional indication of model overall fit, the Chi-Square Statistic can be sensitive to sample size. Since the likelihood of rejecting the model in error increases as the sample size increases (Joreskog & Sorbom, 1993; Bentler & Bonnet, 1980), other indicators of goodness of fit are evaluated to more comprehensively assess overall goodness of fit for the model. These indicators included Chi-Square/degrees of freedom ratio equal to (.712), goodness of fit index (GFI = .996), adjusted goodness of fit index (AGFI = .993), normed fit index (NFI =.995) and the root mean square residual (RMR = .0874)

DISCUSSION AND CONCLUSION

Student persistence decisions are more comprehensively explained by the new integrated model explored in this investigation, through the inclusion and dynamic interplay of the theory of planned behavior (Ajzen, 1991) subsumed therein. An examination of the total effects of the endogenous variables on CDMSE (see Figure 2), the total effects of intent to persist and persistence (see Tables 2 and 3), and the explained variance computed for all eleven endogenous variables support this conclusion.

Clear policy implications arise for higher education institutions that provide undergraduate degree programs for adult/nontraditional students. In order to be effective and

efficient, institutions that provide degree programs for adults must assess how well they are serving nontraditional learners. Attention must be placed on helping adult students achieve their goals and on assisting nontraditional learners with the critical developmental task of career decision-making and planning. As the findings indicate, CDMSE has a moderate effect on the feeling of being a part of the academic life of the institution and a moderate effect on the academic performance of nontraditional learners. Traditional academic or cognitive efforts at increasing the academic performance and academic integration of students need to be redoubled by the faculty by developing strategies for excellence in teaching that incorporate collaborative ties with the environment beyond the institution walls. As Clark Kerr (1997) has speculated about the "increasingly indeterminate future of higher education in the United States," the administration needs to provide an enhanced environment that is geared to deliver an academic curriculum that supports or elicits quality relationships involving faculty and students perhaps through mentoring (Campbell & Campbell, 1997) and collaborative activities outside the academy.

The integrated model of student persistence discussed here presents nonrecursive path activity and reciprocal path linkages that explore relationships within a full 360 degrees. Important new theoretical implications have arisen to account for the explanation of various endogenous outcomes, the persistence decisions and behavior of adult students. Although the general direction of path total effects move generally from left to right from independent to dependent variables, the nonrecursive and reciprocal linkages explored are not limited to a single direction. Among the endogenous variables linked in a path diagram (see Figure 4), the integrated model of student persistence explores the notion of triadic reciprocal causation among person, environment and behavior put forward by Bandura (1997; 1986). That is, reciprocal linkages are included among independent and dependent outcomes in a path model that ultimately lead to the criterion variable, persistence. In short,

the model provides an interactionist perspective of social cognitive learning (Bandura, 1997) and the environment that moves beyond the person-environment fit solutions of Tinto, Bean and Cabrera to a path model that is more inclusive and dynamic. It reflects upon a developmental exchange among adult students, the environment and the institution.

Detailed feedback loops and other model or network related linkages and associations are also accounted for, tested, and evaluated. As the standardized total effects elucidate between four pairs of variables, reciprocal path linkages are observed between the following: career decision-making self-efficacy and academic integration, financial attitudes/difficulty and institutional commitment, institutional commitment and goal commitment, cumulative GPA and intent to persist. These pairs of reciprocal relationships and other nonrecursive path linkages are identified and empirically verified, among a body of structural relations and a total system of integrated behaviors, that ultimately lead to the central variable of this paper, persistence.

In addition, nonrecursive path activity entail feedback loops that gain empirical verification with this investigation. These feedback loops explore interesting elements of nontraditional student behavior based on theoretical or conceptual explanations that are embedded within the hypothetical relationships and theories that comprise the integrated model of student persistence. For example, the total effects explaining the variable, social support, originates with paths from academic integration, cumulative GPA and institutional commitment. These paths provide explanations that are new to the literature and earmark how organizational variables can effect environmental outcomes like "encouragement from friends and family." More directly, the deferred social reward of social support becomes reinstated or reactivated for adult students as the total effects of social support on academic integration, cumulative GPA and institutional commitment are recognized by friends and family. Similar explanations related to nonrecursive activity and other path relationships

arise in the integrated model of student persistence regarding the endogenous outcomes financial attitudes/difficulty and social integration.

In closing, it is recommended that the administration and faculty explore collaborative links, perhaps partnering with other private and public organizations. In doing so, higher education institutions can develop strategies that help nontraditional learners feel more a part of academic enterprise by embracing the larger environment and pragmatic concerns of the workplace. In turn, as subsequent path relationships within the integrated model of student persistence indicate, academic performance and academic integration, as independent variables, have moderate effects on the intent to persist of adult students within a "seamless learning environment" (Kuh, 1996). Ultimately cumulative GPA and intent to persist have the strongest influence, as the moderate total effects on the re-enrollment or persistence of adult students at the institution indicates. By attuning to the career self-efficacy belief sources of adult students (Bandura, 1989) and redoubling traditional efforts at enhancing their academic integration and performance, the faculty and administration can affect the attitudes of adult students about persistence.

Additionally the actual behavior of re-enrollment or persistence of nontraditional learners can be increased by blending a traditional academic response with desirable vocational aspects of adult student life. Thereby institutions can provide integrated institutional responses that develop the career self-efficacy belief sources of nontraditional learners (Bandura, 1977; 1989) and provide adult degree education programming attuned to the academic development and career horizons of their populations. Programs of advisement and counseling need to be designed to help students with varying levels of career indecision whereby the maturity of college student attitudes toward career development can be differentially targeted and treated (Luzzo, 1996; 1995; Lent et al., 1994). A burgeoning of new literature pertaining to self-efficacy and social cognitive theory has emerged since the seminal monograph of Lent et al. (1994) was published. A new acronym has been coined for a mature counseling paradigm,

called social cognitive career theory (Lent et al., 1996), "SCCT," thus ear-marking the emergence of a serious movement in the career counseling and vocational behavior literature that has a number of practical implications.

Career educational programming for adults and strategies of intervention with nontraditional learners need to be developed and exercised to target, diversify and increase the cognitive-initiated agentive behavioral repertoires of adult learners about the liberal arts curriculum and about various careers and professions. A first step for those interested may be the June 1996 "Special Section: Applying Social Cognitive Theory to Career Counseling" of The Career Development Quarterly and an article by Lent and Brown (1996) that provides an overview about the same.

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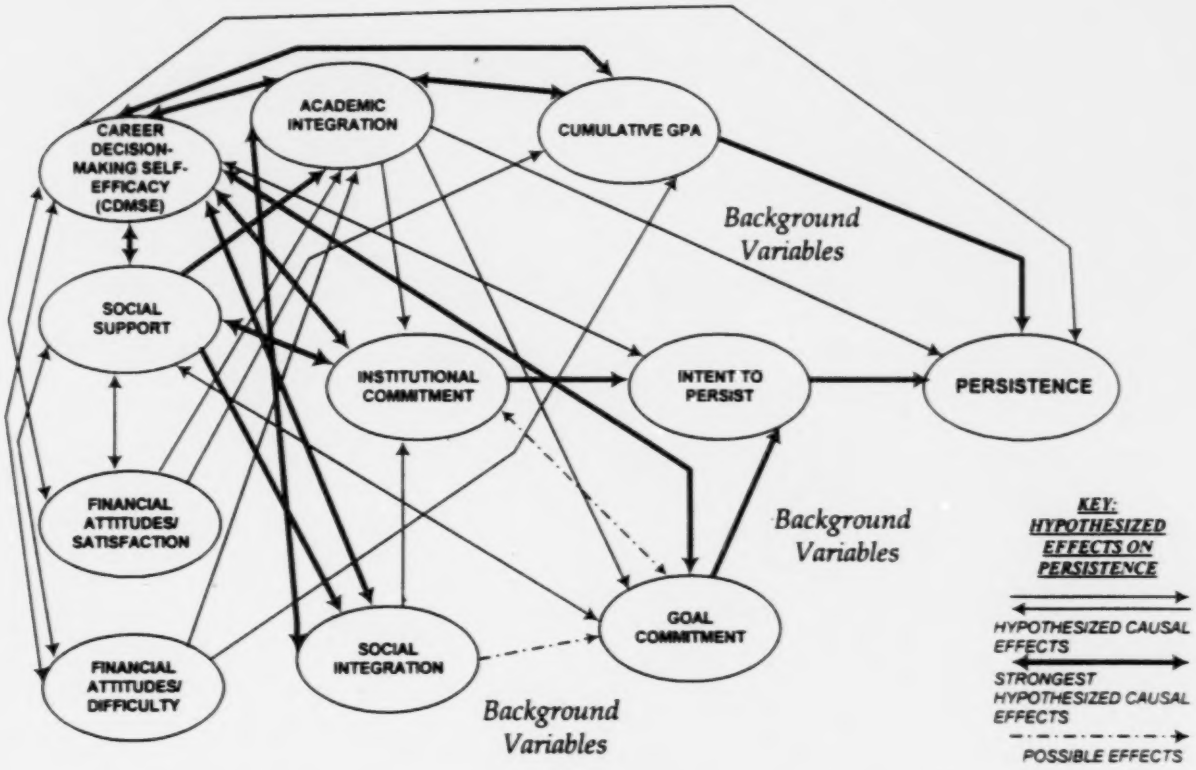
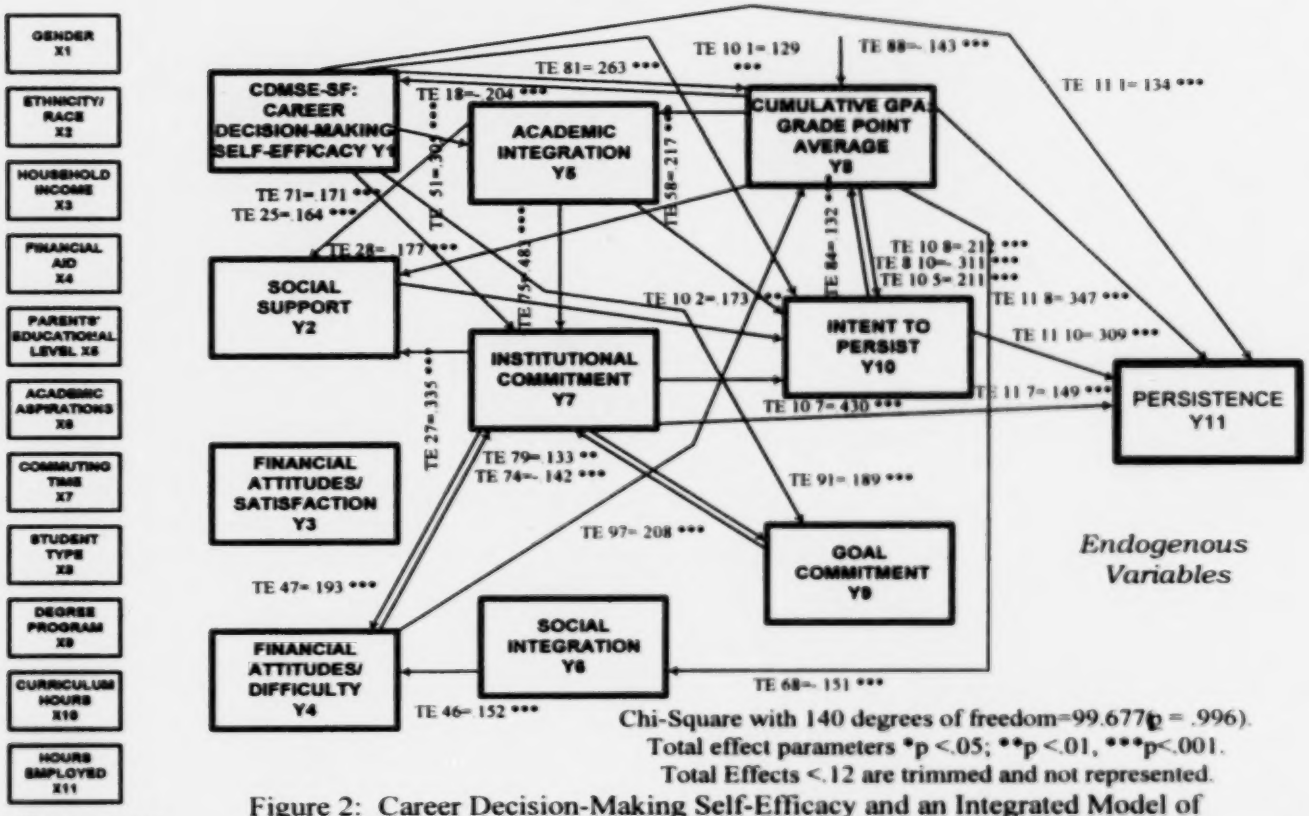


Figure 1: Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence: A Hypothetical Model



Chi-Square with 140 degrees of freedom=99.677(p = .996).
Total effect parameters *p <.05; **p <.01, ***p<.001.
Total Effects <.12 are trimmed and not represented.

Figure 2: Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence: Total Effects Among the Endogenous Variables Within a Trimmed Model

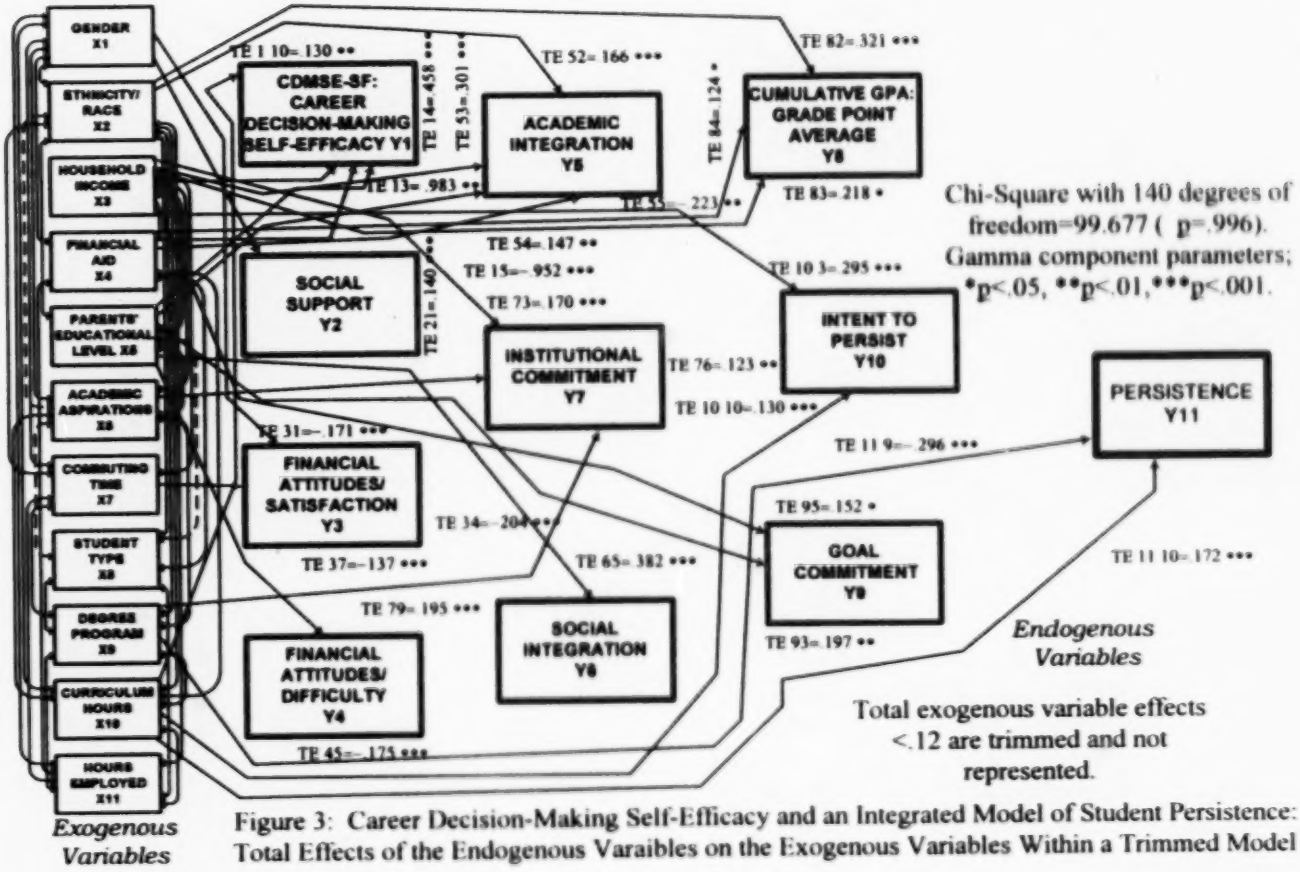


Figure 3: Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence: Total Effects of the Endogenous Varaibles on the Exogenous Variables Within a Trimmed Model

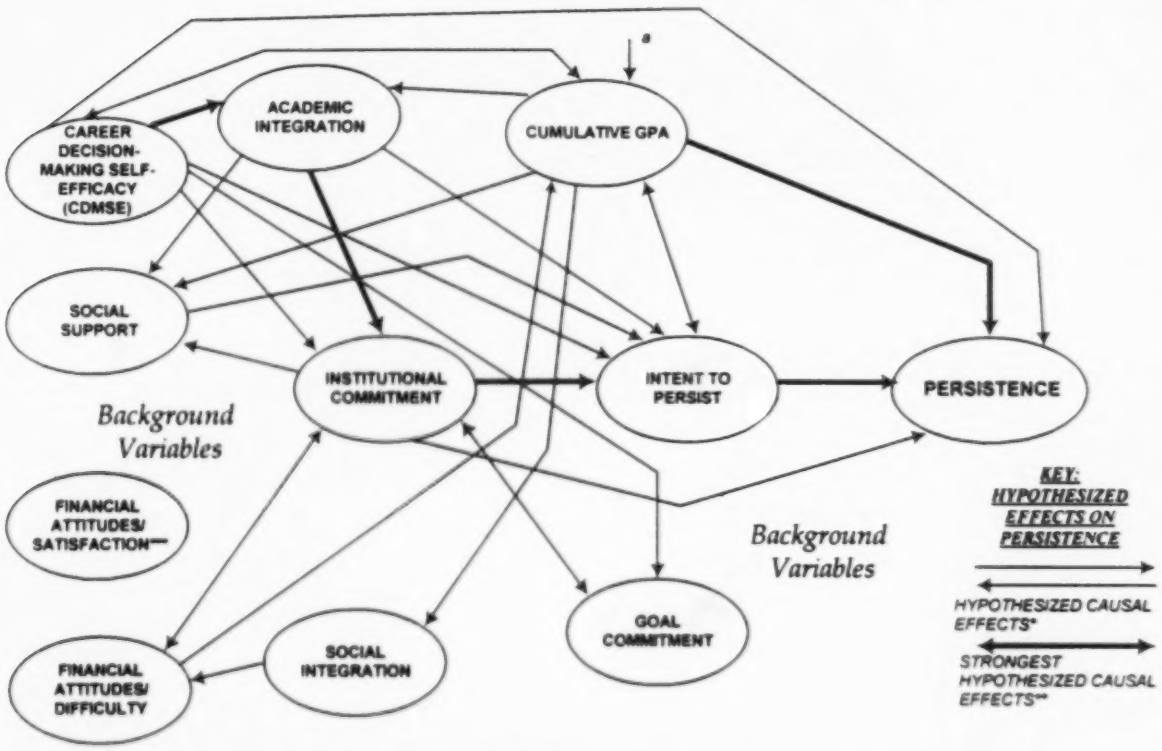


Figure 4: Career Decision-Making Self-Efficacy and an Integrated Model of Student Persistence: A Final Trimmed Model

* total effects > .12.
** total effects at moderate levels or higher affecting variables with moderate levels of explained variance.
a represents total effect of variable on itself.
*** before deleting variable effects < .12 ought to be considered.

Table 1

Alpha Reliability Analysis
Endogenous Variables

(N=455)

Endogenous Variables	Number of Items	Cronbach Alpha
Career Decision-Making Self-Efficacy (CDMSE-SF)	25	.96
Social Support	4	.70
Financial Attitudes/Satisfaction	2	.84
Financial Attitudes/Difficulty	3	.65
Academic Integration	3	.56
Social Integration	3	.74
Institutional Commitment	4	.77
Goal Commitment	2	.68
Intent to Persist	5	.67

Table 2

Total, Direct, and Indirect Effects of Intent to Persist on the Endogenous Variables with the Exogenous Variables Controlled

(N = 455)

	Indirect Effect[b]	Direct Effect[a]	Total Effect[b]	Rank of Total Effect[@]
Career Decision-Making Self-Efficacy	.129***	.000[c]	.129***	5
Social Support	-.019***	.192***	.173***	4
Financial Attitudes/ Satisfaction	.022**	.000[c]	.022**	9
Financial Attitudes/ Difficulty	-.040***	.000[c]	-.040***	8
Academic Integration	.211***	.000[c]	.211***	3
Social Integration	-.006**	.000[c]	-.006**	10
Institutional Commitment	.040**	.390***	.430***	1
Cumulative GPA	.051***	.161***	.212***	2
Goal Commitment	.058**	.000[c]	.058**	7
Intent to Persist	-.077***	.000[c]	-.077***	6
Persistence	--	--	--	--

R^2 = .277

* $p < .05$

** $p < .01$

*** $p < .001$

[a] Standardized structural coefficient.

[b] computed from standardized structural coefficient.

[c] Fixed or constrained relationship determined by hypotheses, or with subsequent theoretical reassessment adjusted by the researcher, as a constrained relationship, to facilitate structural equation model fitting.

[@] Total effect values at the $p < .01$ level of significance are ranked in order of descending magnitude.

Table 3

Total, Direct, and Indirect Effects of Intent to Persist on the Exogenous Variables

(N = 455)

	Indirect Effect[b]	Direct Effect[a]	Total Effect[b]	Rank of Total Effect[@]
Gender	.005	.095***	.100***	3
Ethnicity/Race	.030*	.000	.030*	8
Household Income	.120**	.175***	.295***	1
Financial Aid	.043*	.000	.043*	7
Parents' Educational Level	−.026	.000	−.026	
Academic Aspirations	.053**	.000	.053**	5
Commuting Time	−.022*	.000	−.022*	9
Student Type	−.047***	.000	−.047***	6
Degree Program	.087***	.000	.087***	4
Curriculum Hours	.007	.123***	.130***	2
Hours Employed	−.009***	.000	−.009***	10

* $p < .05$
** $p < .01$
*** $p < .001$
[a] Standardized structural coefficient.
[b] computed from standardized structural coefficient.
[@] Total effect values at the $p < .05$ level of significance are ranked in order of descending magnitude.

Table 4

Total, Direct, and Indirect Effects of Persistence on the Endogenous Variables with the Exogenous Variables Controlled

(N = 455)

	Indirect Effect[b]	Direct Effect[a]	Total Effect[b]	Rank of Total Effect[@]
Career Decision-Making Self-Efficacy	.134***	.000[c]	.134***	4
Social Support	.058***	.000[c]	.058***	6
Financial Attitudes/ Satisfaction	.036**	−.061**	−.025	
Financial Attitudes/ Difficulty	.027***	.000[c]	.027***	7
Academic Integration	.073***	.000[c]	.073***	5
Social Integration	.004**	.000[c]	.004**	9
Institutional Commitment	.149***	.000[c]	.149***	3
Cumulative GPA	.049**	.298***	.347***	1
Goal Commitment	.020**	.000[c]	.020**	8
Intent to Persist	−.126***	.435***	.309***	2
Persistence	--	--	--	--

R^2 = .340

* $p < .05$

** $p < .01$

*** $p < .001$

[a] Standardized structural coefficient.

[b] computed from standardized structural coefficient.

[c] Fixed or constrained relationship determined by hypotheses, or with subsequent theoretical reassessment adjusted by the researcher, as a constrained relationship, to facilitate structural equation model fitting.

[@] Total effect values at the $p < .01$ level of significance are ranked in order of descending magnitude.

Table 5

Total, Direct, and Indirect Effects of Persistence on the Exogenous Variables

(N = 455)

	Indirect Effect[b]	Direct Effect[a]	Total Effect[b]	Rank of Total Effect[@]
Gender	.038***	.000	.038***	6
Ethnicity/Race	.106***	−.119***	−.013	
Household Income	.192***	−.278***	−.086	
Financial Aid	.068**	.000	.068**	4
Parents' Educational Level	−.008	.000	−.008	
Academic Aspirations	.016*	.000	.016*	7
Commuting Time	−.006	.000	−.006	
Student Type	−.013***	.125***	.112***	3
Degree Program	.027***	−.323***	−.296***	1
Curriculum Hours	.055***	.117***	.172***	2
Hours Employed	−.002*	.047***	.045***	5

* $p < .05$
** $p < .01$
*** $p < .001$
[a] Standardized structural coefficient.
[b] computed from standardized structural coefficient.
[@] Total effect values at the $p < .05$ level of significance are ranked in order of descending magnitude.